

**WHAT IS CLAIMED IS:**

1. A method of performing a special adjustment to a temporary mobile subscriber identity generation field value for use in response to a restart operation, the method comprising:
  - 5 determining a minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with a predetermined percentage of all mobile subscribers; and  
adjusting the temporary mobile subscriber identity generation field value as a function of the minimum integer amount.
- 10 2. The method of claim 1, wherein the step of adjusting the temporary mobile subscriber identity generation field value as a function of the minimum integer amount comprises setting the temporary mobile subscriber identity generation field value equal to the minimum integer amount.
- 15 3. The method of claim 1, wherein the step of determining the minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with the predetermined percentage of all mobile subscribers comprises:
  - 20 determining a probability density as a function of temporary mobile subscriber identity generation value;  
integrating the probability density across an entire range of temporary mobile subscriber identity generation values to determine a total integral; and  
determining the minimum integer amount such that an integral of the probability density from zero to the minimum integer amount yields a smaller integral that is the predetermined percentage of the total integral.

4. A method of managing a temporary mobile subscriber identity for allocation to a mobile subscriber, wherein the temporary mobile subscriber identity comprises a temporary mobile subscriber identity identification field and a temporary mobile subscriber identity generation field, the method comprising:

5 selecting a free temporary mobile subscriber identity identification field value;

determining a present temporary mobile subscriber identity generation field value associated with the selected temporary mobile subscriber identity identification field value;

10 if the free temporary mobile subscriber identity identification field value has previously been allocated since a most recent restart operation, then performing a normal allocation adjustment to the present temporary mobile subscriber identity generation field value, thereby producing an adjusted temporary mobile subscriber identity generation field value;

15 if the free temporary mobile subscriber identity identification field value has not previously been allocated since a most recent restart operation, then performing a special allocation adjustment to the present temporary mobile subscriber identity generation field value, thereby producing the adjusted temporary mobile subscriber identity generation field value;

20 generating a complete temporary mobile subscriber identity from the selected temporary mobile subscriber identity identification value and the adjusted temporary mobile subscriber identity generation field value;

allocating the complete temporary mobile subscriber identity to the mobile subscriber;

25 in response to a first type of release causing event in which the mobile subscriber is informed that the temporary mobile subscriber identity is being released, processing the temporary mobile subscriber identity identification value so that it will be considered free, and performing a normal deallocation adjustment to the adjusted temporary mobile subscriber identity generation field value; and

in response to a second type of release causing event in which the mobile subscriber is not informed that the temporary mobile subscriber identity is being released, processing the temporary mobile subscriber identity identification value so that it will be considered free, and leaving the adjusted temporary mobile subscriber identity generation field value unchanged,

wherein the special allocation adjustment comprises changing the present temporary mobile subscriber identity generation field value as a function of a minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with a predetermined percentage of all mobile subscribers.

5. The method of claim 4, wherein the special allocation adjustment comprises setting the present temporary mobile subscriber identity generation field value equal to the minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with the predetermined percentage of all mobile subscribers.

6. The method of claim 4, further comprising:

in response to the restart operation, processing all temporary mobile subscriber identity identification values so that none of the temporary mobile subscriber identity identification values will be considered unused.

7. The method of claim 4, wherein the normal allocation adjustment to the present temporary mobile subscriber identity generation field value comprises changing the present temporary mobile subscriber identity generation field value by a predetermined value.

8. The method of claim 4, wherein the normal deallocation adjustment to the adjusted temporary mobile subscriber identity generation field value comprises

performing an operation that restores the adjusted temporary mobile subscriber identity generation field value to the present temporary mobile subscriber identity generation field value.

5 9. The method of claim 4, wherein the normal allocation adjustment to the present temporary mobile subscriber identity generation field value comprises incrementing the temporary mobile subscriber identity generation field value by an amount equal to 1.

10 10. The method of claim 9, wherein the normal deallocation adjustment to the adjusted temporary mobile subscriber identity generation field value comprises subtracting a value of 1 from the adjusted temporary mobile subscriber identity generation field value.

15 11. The method of claim 4, further comprising determining the minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with the predetermined percentage of all mobile subscribers,

and wherein the step of determining the minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with the predetermined percentage of all mobile subscribers comprises:

20 determining a probability density as a function of temporary mobile subscriber identity generation value;

integrating the probability density across an entire range of temporary mobile subscriber identity generation values to determine a total integral; and

25 determining the minimum integer amount such that an integral of the probability density from zero to the integer amount yields a smaller integral that is the predetermined percentage of the total integral.

12. An apparatus for performing a special adjustment to a temporary mobile subscriber identity generation field value for use in response to a restart operation, the apparatus comprising:

5 logic that determines a minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with a predetermined percentage of all mobile subscribers; and

logic that adjusts the temporary mobile subscriber identity generation field value as a function of the minimum integer amount.

10 13. The apparatus of claim 12, wherein the logic that adjusts the temporary mobile subscriber identity generation field value as a function of the minimum integer amount comprises logic that sets the temporary mobile subscriber identity generation field value equal to the minimum integer amount.

15 14. The apparatus of claim 12, wherein the logic that determines the minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with the predetermined percentage of all mobile subscribers comprises:

logic that determines a probability density as a function of temporary mobile subscriber identity generation value;

20 logic that integrates the probability density across an entire range of temporary mobile subscriber identity generation values to determine a total integral; and

logic that determines the minimum integer amount such that an integral of the probability density from zero to the minimum integer amount yields a smaller integral that is the predetermined percentage of the total integral.

25 15. An apparatus for managing a temporary mobile subscriber identity for allocation to a mobile subscriber, wherein the temporary mobile subscriber identity

comprises a temporary mobile subscriber identity identification field and a temporary mobile subscriber identity generation field, the apparatus comprising:

logic that selects a free temporary mobile subscriber identity identification field value;

5        logic that determines a present temporary mobile subscriber identity generation field value associated with the selected temporary mobile subscriber identity identification field value;

10        logic that, if the free temporary mobile subscriber identity identification field value has previously been allocated since a most recent restart operation, performs a normal allocation adjustment to the present temporary mobile subscriber identity generation field value, thereby producing an adjusted temporary mobile subscriber identity generation field value;

15        logic that, if the free temporary mobile subscriber identity identification field value has not previously been allocated since a most recent restart operation, performs a special allocation adjustment to the present temporary mobile subscriber identity generation field value, thereby producing the adjusted temporary mobile subscriber identity generation field value;

20        logic that generates a complete temporary mobile subscriber identity from the selected temporary mobile subscriber identity identification value and the adjusted temporary mobile subscriber identity generation field value;

logic that allocates the complete temporary mobile subscriber identity to the mobile subscriber;

25        logic that, in response to a first type of release causing event in which the mobile subscriber is informed that the temporary mobile subscriber identity is being released, processes the temporary mobile subscriber identity identification value so that it will be considered free, and performing a normal deallocation adjustment to the adjusted temporary mobile subscriber identity generation field value; and

logic that, in response to a second type of release causing event in which the mobile subscriber is not informed that the temporary mobile subscriber identity is being released, processes the temporary mobile subscriber identity identification value so that it will be considered free, and leaving the adjusted temporary mobile subscriber identity generation field value unchanged,

wherein the logic that performs the special allocation adjustment comprises logic that changes the present temporary mobile subscriber identity generation field value as a function of a minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with a predetermined percentage of all mobile subscribers.

16. The apparatus of claim 15, wherein the logic that performs the special allocation adjustment comprises logic that sets the present temporary mobile subscriber identity generation field value equal to the minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with the predetermined percentage of all mobile subscribers.

17. The apparatus of claim 15, further comprising:

logic that, in response to the restart operation, processes all temporary mobile subscriber identity identification values so that none of the temporary mobile subscriber identity identification values will be considered unused.

18. The apparatus of claim 15, wherein the logic that performs the normal allocation adjustment to the present temporary mobile subscriber identity generation field value comprises logic that changes the present temporary mobile subscriber identity generation field value by a predetermined value.

19. The apparatus of claim 15, wherein the logic that performs the normal deallocation adjustment to the adjusted temporary mobile subscriber identity

generation field value comprises logic that performs an operation that restores the adjusted temporary mobile subscriber identity generation field value to the present temporary mobile subscriber identity generation field value.

20. The apparatus of claim 15, wherein the logic that performs the normal allocation adjustment to the present temporary mobile subscriber identity generation field value comprises logic that increments the temporary mobile subscriber identity generation field value by an amount equal to 1.

21. The apparatus of claim 20, wherein the logic that performs the normal deallocation adjustment to the adjusted temporary mobile subscriber identity generation field value comprises logic that subtracts a value of 1 from the adjusted temporary mobile subscriber identity generation field value.

22. The apparatus of claim 15, further comprising logic that determines the minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with the predetermined percentage of all mobile subscribers,

and wherein the logic that determines the minimum integer amount that is higher than temporary mobile subscriber identity generation field values associated with the predetermined percentage of all mobile subscribers comprises:

logic that determines a probability density as a function of temporary mobile subscriber identity generation value;

logic that integrates the probability density across an entire range of temporary mobile subscriber identity generation values to determine a total integral; and

logic that determines the minimum integer amount such that an integral of the probability density from zero to the integer amount yields a smaller integral that is the predetermined percentage of the total integral.